IN THE CLAIMS

1. (Currently Amended) A manufacturing method of a semiconductor module comprising:

a first joining step for joining first circuit electrodes which are formed on a circuit board and back-surface-side die electrodes of a semiconductor die which forms die electrodes on both front and back surfaces;

a second joining step for joining the front-surface-side die electrodes of the semiconductor die and one ends of linear or plate-like connecting members; and

a third joining step for joining another ends of the connecting members and second circuit electrodes which are formed on the circuit board[[,]];

wherein ~~in at least one~~ each of the first joining step, the second joining step and the third joining step, a low-melting-point metal layer is preliminarily formed on at least one of a pair of conductive portions to be connected with each other and, thereafter, the pair of conductive portions are arranged to face each other and are heated and pressurized at a temperature which melts at least the low-melting-point metal thus diffusing the low-melting-point metal layer into the pair of conductive portions by solid-liquid diffusion whereby the pair of conductive portions are joined to each other; and

wherein the first joining step, the second joining step and the third joining step are performed sequentially.

2. (Withdrawn-Currently Amended) A manufacturing method of a semiconductor device comprising:

a first joining step for joining first circuit electrodes which are formed on a circuit board and back-surface-side die electrodes of a semiconductor die which forms die electrodes on both front and back surfaces;

a second joining step for joining the front-surface-side die electrodes of the semiconductor die and one ends of linear or plate-like connecting members;

a third joining step for joining another ends of the connecting members and second circuit electrodes which are formed on the circuit board; and

a fourth joining step for joining a third circuit electrode formed on the circuit board and a heat radiating member made of metal;

wherein ~~in at least one~~ each of the first joining step, the second joining step and the third joining step and the fourth joining step, a low-melting-point metal layer is preliminarily formed on at least one of a pair of conductive portions to be connected with each other and, thereafter, the

pair of conductive portions are arranged to face each other and are heated and pressurized at a temperature which melts at least the low-melting-point metal thus diffusing the low-melting-point metal layer into the pair of conductive portions by solid-liquid diffusion whereby the pair of conductive portions are joined to each other; and

wherein the first joining step, the second joining step, the third joining step and the fourth joining step are performed sequentially.

3. (Withdrawn) A manufacturing method of a semiconductor module according to claim 1 or 2, wherein the low-melting-point metal layer is formed on at least one of the pair of conductive portions, a metal foil is interposed between the pair of conductive portions, and the pair of conductive portions are heated and pressurized.

4. (Withdrawn-Currently Amended) A manufacturing method of a semiconductor module comprising:

a first joining step for joining first circuit electrodes which are formed on a circuit board and back-surface-side die electrodes of a semiconductor die which forms die electrodes on both front and back surfaces;

a second joining step for joining the front-surface-side die electrodes of the semiconductor die and one ends of linear or plate-like connecting members; and

a third joining step for joining another ends of the connecting members and second circuit electrodes which are formed on the circuit board[[,]];

wherein ~~in at least one~~ each of the first joining step, the second joining step and the third joining step, a low-melting-point metal layer is preliminarily formed on at least one surface or both surfaces of a metal foil, and, thereafter, the pair of conductive portions to be connected are arranged to face each other, the metal foil is interposed between the pair of conductive portions, the pair of conductive portions are heated and pressurized at a temperature which melts at least the low-melting-point metal thus diffusing the low-melting-point metal layer into the pair of conductive portions by solid-liquid diffusion whereby the pair of conductive portions are joined to each other; and

wherein the first joining step, the second joining step and the third joining step are performed sequentially.

5. (Withdrawn-Currently Amended) A manufacturing method of a semiconductor module comprising:

a first joining step for joining first circuit electrodes which are formed on a circuit board and back-surface-side die electrodes of a semiconductor die which forms die electrodes on both front and back surfaces;

a second joining step for joining the front-surface-side die electrodes of the semiconductor die and one ends of linear or plate-like connecting members;

a third joining step for joining another ends of the connecting members and second circuit electrodes which are formed on the circuit board; and

a fourth joining step for joining a third circuit electrode formed on the circuit board and a heat radiating member made of metal;

wherein ~~in at least one~~ each of the first joining step, the second joining step and the third joining step and the fourth joining step, a low-melting-point metal layer is preliminarily formed on at least one surface or both surfaces of a metal foil, and, thereafter, the pair of conductive portions to be connected are arranged to face each other, the metal foil is interposed between the pair of conductive portions, the pair of conductive portions are heated and pressurized at a temperature which melts at least the low-melting-point metal thus diffusing the low-melting-point metal layer into the pair of conductive portions by solid-liquid diffusion whereby the pair of conductive portions are joined to each other; and

wherein the first joining step, the second joining step, the third joining step and the fourth joining step are performed sequentially

6. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the low-melting-point metal layer contains at least one selected from a group consisting of SnIn, In, Bi, SnBi.

7. (Original) A manufacturing method of a semiconductor module according to claim 6, wherein a heating temperature at the time of the joining is a temperature which is 0 to 100°C higher than the melting point of the low-melting-point metal.

8. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein a total thickness of the low-melting-point metal layer which is formed preliminarily between the pair of conductive portions assumes a value which falls within a range from 0.1 to 1 μm.

9. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein a material of the pair of conductive portions is one selected from a group consisting of Cu, Ni, Au, Al or alloy thereof.

10. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the heating-and-pressurizing is performed until the low-melting-point metal layer is completely diffused in the pair of conductive portions by solid-liquid diffusion.

11. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the heating-and-pressurizing is performed until the low-melting-point metal layer forms an intermediate alloy layer between the pair of conductive portions.

12. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the connection member is a lead frame.

13. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the surfaces of the pair of conductive portions are formed of coarse surfaces having the surface roughness Ra of 0.4 to 10 μm.

14. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the low-melting-point metal layer is formed such that at least two kinds of metals which can form alloy are stacked in two layers or more, and the stacked metal layers are preheated to make the metal layers react with each other to form an alloy layer.

15. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the low-melting-point metal layer is formed by vapor-depositing alloy which constitutes an evaporation source and, at the time of performing the vapor deposition, an evaporation pressure ratio in reaction steps of respective metal components of the alloy is controlled thus forming a film having the target alloy composition.

16. (Previously Presented) A manufacturing method of a semiconductor module according to any one of claims 1, 2, 4 and 5, wherein the low-melting-point metal layer is formed by vapor-depositing alloy which constitutes an evaporation source and, at the time of performing the vapor deposition, a product of an evaporation pressure ratio and an active coefficient ratio in reaction steps of respective metal components of the alloy is controlled thus forming a film having the target alloy composition.

17. (New) A manufacturing method of a semiconductor module according to claim 1, wherein the low-melting-point metal layer includes a eutectic alloy of Sn/In.

18. (New) A manufacturing method of a semiconductor module according to claim 14, wherein the low-melting-point metal layer has a melting point no higher than 220 .

19. (New) A manufacturing method of a semiconductor module according to claim 14, wherein the stacked metal layers are preheated at a temperature no higher than the lowest one of the melting points of the at least two kinds of metal.

20. (New) A manufacturing method of a semiconductor module according to claim 19, wherein Sn and In are stacked in two or more layers, and the stacked metal layers are preheated at a temperature of 110 to 125 °C.

21. (New) A manufacturing method of a semiconductor module according to claim 1, wherein the semiconductor module comprises a power semiconductor module.

22. (New) A manufacturing method of a semiconductor module according to claim 21, wherein the power semiconductor module comprises an insulating gate type bipolar transistor.